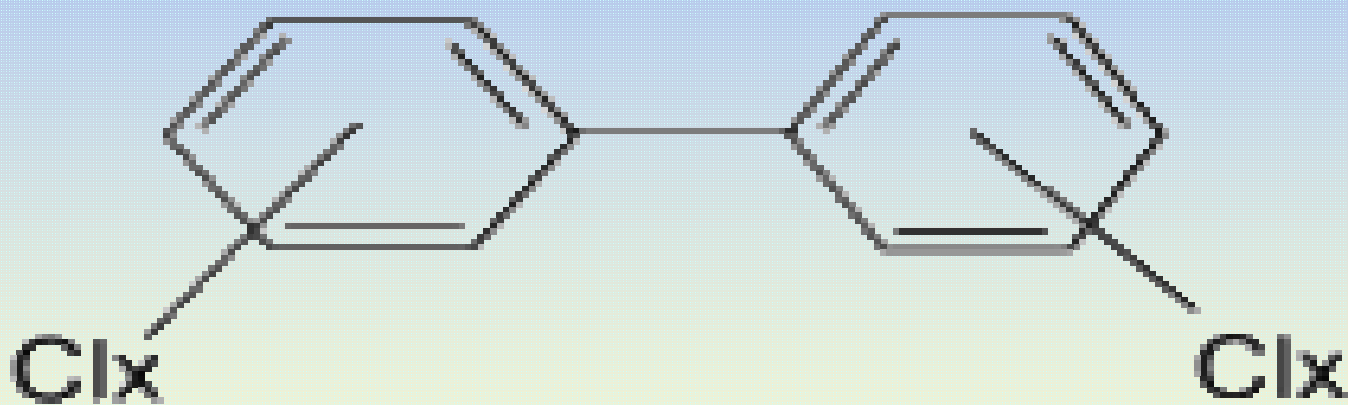


# PCB TMDL Monitoring Guidance

## VPDES Point Source Discharges



Alan Pollock, Charles Martin & Arthur Butt

VADEQ

March 29, 2007

# Overview

- **Objective**
- **Background**
- **Presentation**
  - Delaware River Basin Commission

< Lunch >

## Guidance Development

- **Monitoring & Methods**
- **Permit Guidance**
- **Issues**
  - **Where**
  - **Who**
  - **When**



# Objective

- *To establish guidance and procedures for implementing PCB point source monitoring through the VPDES permit program for development of TMDLs.*
- **Schedule – 3 meetings**
  - *2nd meeting with draft - May*
  - *Final meeting with guidance document - July*

# Purpose

## Develop Total Maximum Daily Load (TMDL)

### **Collect source-specific PCB effluent to:**

- improve information concerning potential sources of PCBs
- develop PCB monitoring procedures
  - ensures representative and comparable
  - adopt sampling and analytical procedures

# **Role of the TAC**

## **Guidance Development**

The Technical Advisory Committee (TAC) represents the interested agencies, utilities, local governments, businesses, and environmental groups. The TAC will:

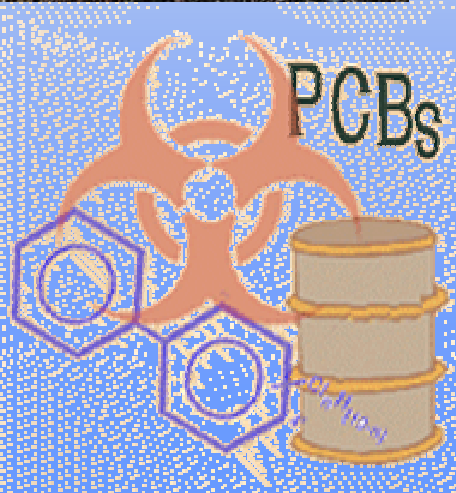
- review methods & processes
- advise on technical issues
- assist with guidance development
- assist with public outreach

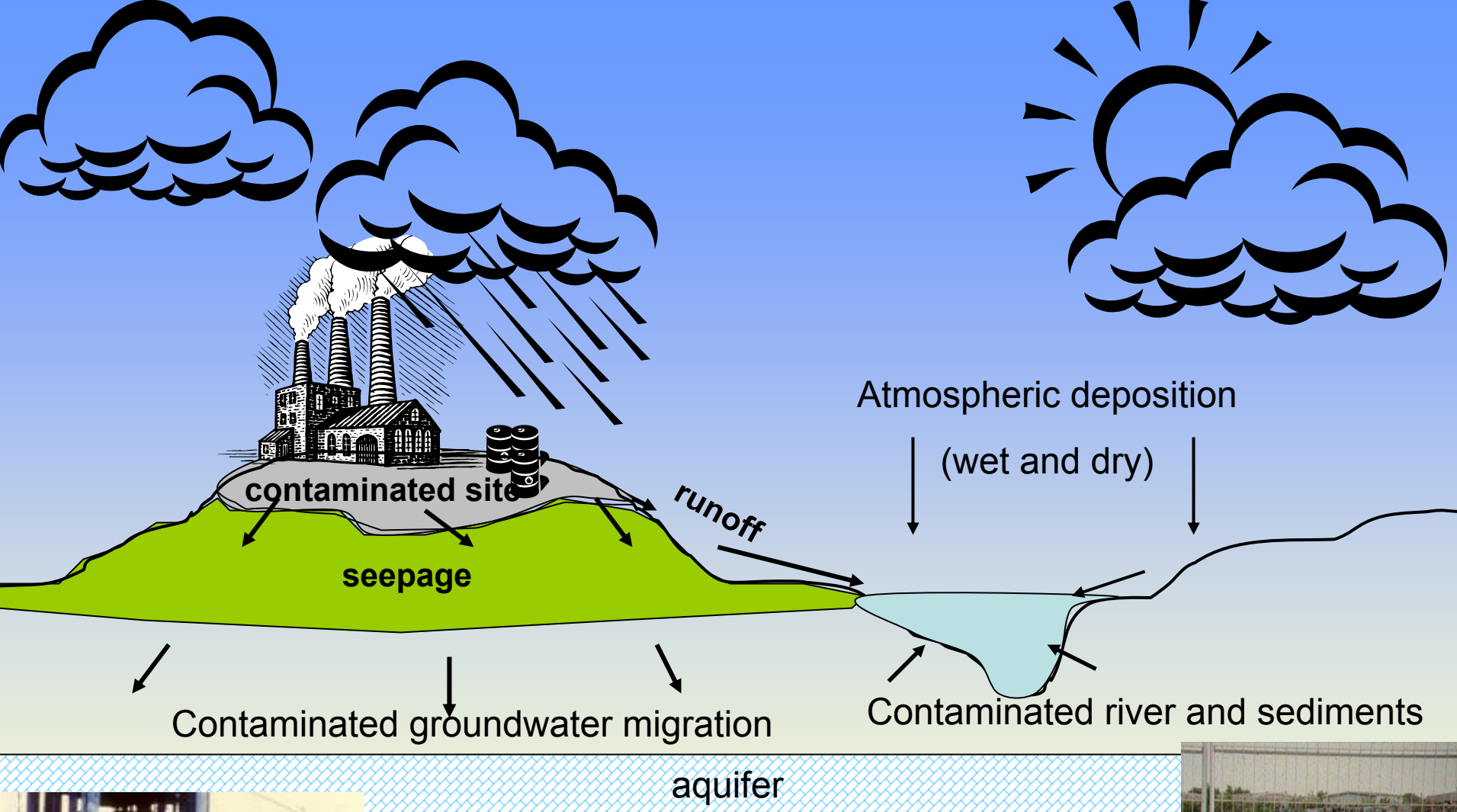
**Background**

**--**

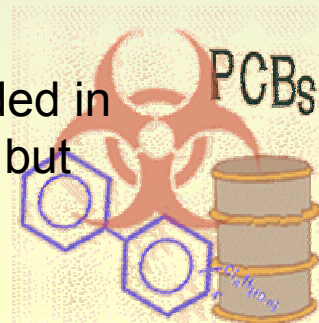
**Charles Martin**

# What's the Problem?





1.5 metric tons manufactured worldwide. US production ended in 1977 – banned by EU in 1985 but stockpiles still exist



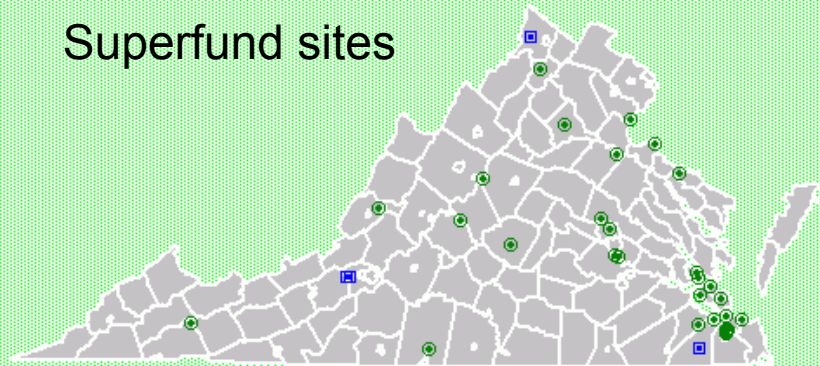
# Legacy Toxicant?

- Scrap Metal salvage yard
- Fluorescent Light Ballasts
- Metal Recycling yard/transfer station
- Oil Recycling facility
- Rail shipping/storage yard
- Concrete facility/product(s)
- Power generating facilities or transformer stations
- Electronic Components
- Flame Retardants in Lubricating Oils
- Natural gas compressor station(s)
- Carbonless copy paper
- Submersible well pumps
- Plasticizers in sealants, caulking, synthetic resins, rubbers, paints, waxes and asphalts
- MODEF - atmospheric





## Superfund sites



# What's a TMDL?



# Total Maximum Daily Load

- a pollution budget
- a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet **water quality standards**
- includes an **allocation** of that maximum amount to each pollutant source

# When are TMDLs needed?

- State and federal law require TMDLs to be developed for **impaired** waters
- Impaired waters do not meet applicable **water quality standards** (WQS)
- Waters that do not meet WQS do not support their **designated use(s)**

# How is a TMDL developed?

- Identify **all sources** of a given pollutant (e.g., PCBs) within the watershed.
- Calculate the **amount** of pollutant entering the estuary from each source.
- Include pollutant **fate and transport** .
- Calculate the **pollutant reductions needed**, by source, to attain water quality standards.
- **Allocate the allowable loading** to each source and include a margin of safety.

# Definition

Summarized as:

$$\text{TMDL} = \sum (\text{WLA} + \text{LA}) + \text{MOS}$$

Where:

- TMDL = Total Maximum Daily Load
- WLA = Waste Load Allocation (point sources incl. permitted stormwater discharges)
- LA = Load Allocation (nonpoint sources)
- MOS = Margin of Safety



# Fish Consumption

**ADVISORY:** Fish taken from these waters may contain PCBs. Eat no more than one meal per month of any fish taken from the advisory area. Women who are pregnant or may become pregnant, nursing mothers, and young children should not eat any fish taken from these waters.  
(5/15/03)

[http://www.vdh.state.va.us/hhcontrol/fishing\\_advisories.htm](http://www.vdh.state.va.us/hhcontrol/fishing_advisories.htm)



# VA Criteria

**Consumption  
Advisories  
Fish Tissue  
(ng/g)**

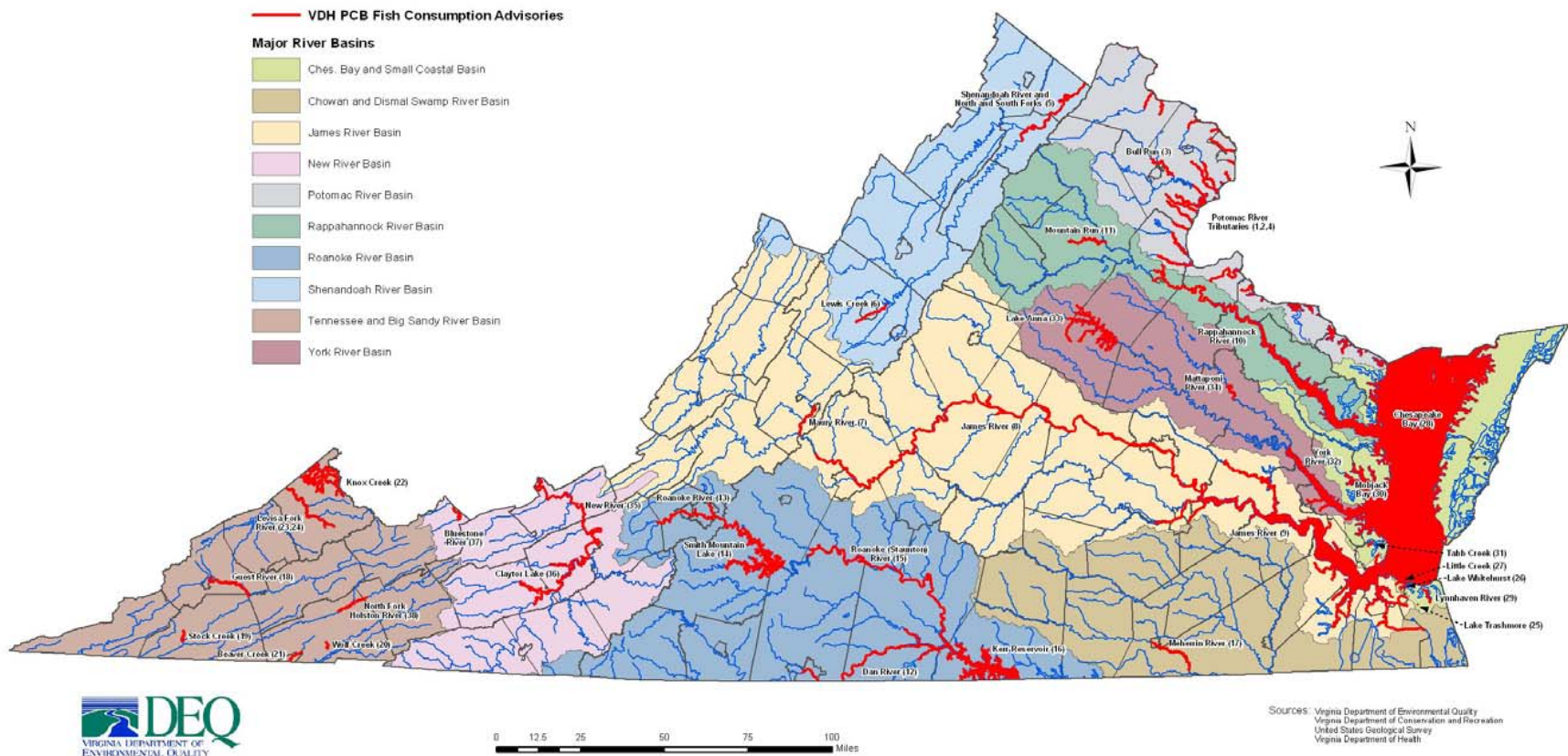
**54**

**Water Quality  
Standards  
Total PCBs (ng/L)**

**1.70 \***

## PCBs in Fish Tissue for 2006

- **973 River Miles**
- **72,000 acres in Lakes**
- **2,110 sq miles of Estuarine Waters**



# PCBs Fish Tissue Impairments

## - 2006 Assessment -

<b>Basin</b>	<b>River Miles</b>	<b>Estuary (sq miles)</b>	<b>Lakes (acres)</b>
Chesapeake Bay	0	<b>1,634</b>	534
Poto/Shen	98	30	101
Rappahannock	29	129	0
York River	17	58	9,585
James	<b>209</b>	<b>259</b>	0
Chowan - Dismal	27	0	0
Roanoke	<b>212</b>	0	<b>57,502</b>
Tenn/Big Sandy	<b>274</b>	-	0
New River Basin	108	-	4,287

# PCB's

- ❑ Man-made organic chemicals with a biphenyl base structure and 209 possible chlorine substitution patterns.
- ❑ Terminology: aroclors, congeners, homologs.
- ❑ Properties: Hydrophobic, tend to accumulate in sediments and tissues
- ❑ Probable liver damage and carcinogen

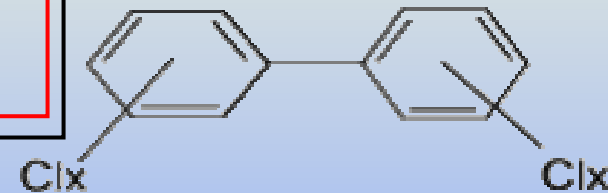


TABLE 7  
SPECIFIC PCB CONGENERS IN AROCLORS

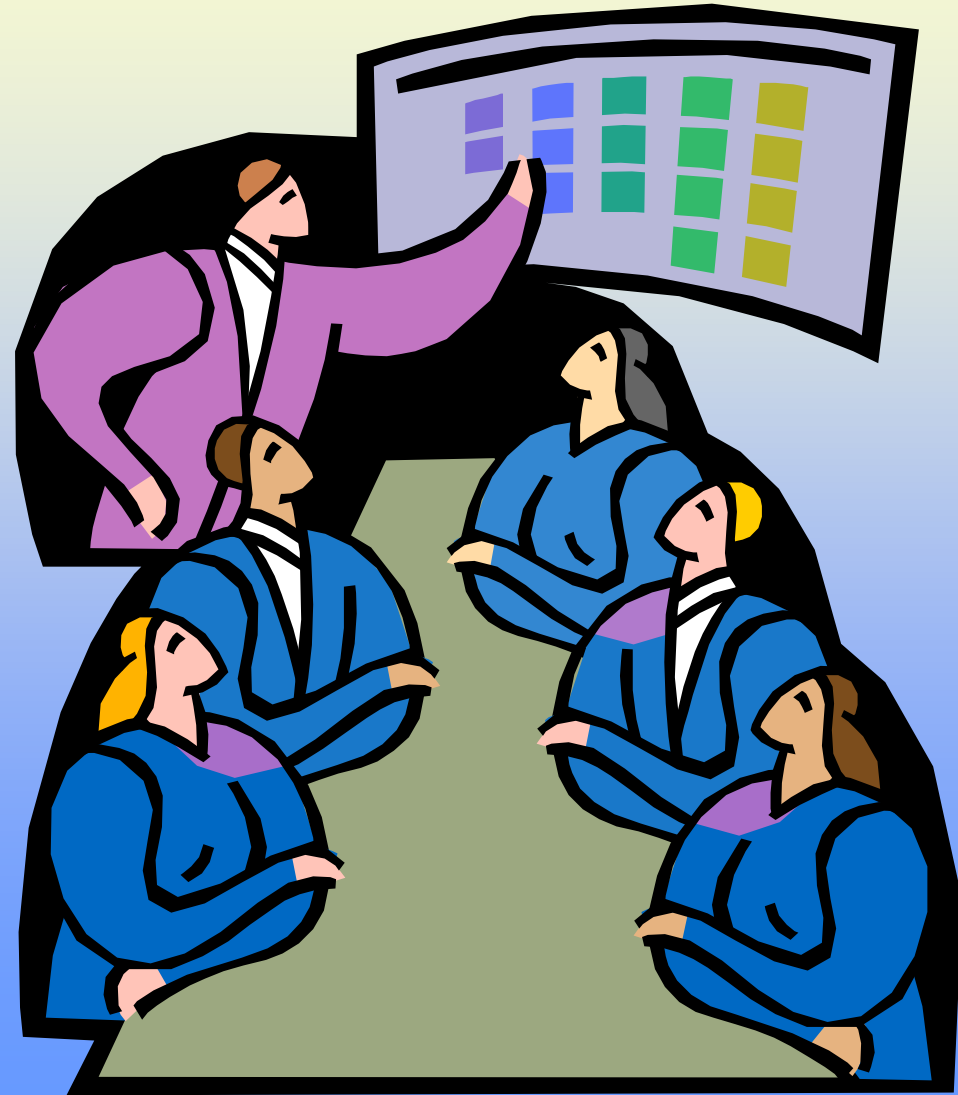
Congener	IUPAC number	1016	1221	1232	Aroclor 1242	1248	1254	1260
Biphenyl	—		X					
2-CB	1	X	X	X	X			
23-DCB	5	X	X	X	X	X		
34-DCB	12	X		X	X	X		
244'-TCB	28*	X		X	X	X	X	
22'35'-TCB	44			X	X	X	X	X
23'44'-TCB	66*					X	X	X
233'46'-PCB	110						X	
23'44'5'-PCB	118*						X	X
22'44'55'-HCB	153							X
22'344'5'-HCB	138							X
22'344'55'-HpCB	180							X
22'33'44'5'-HpCB	170							X

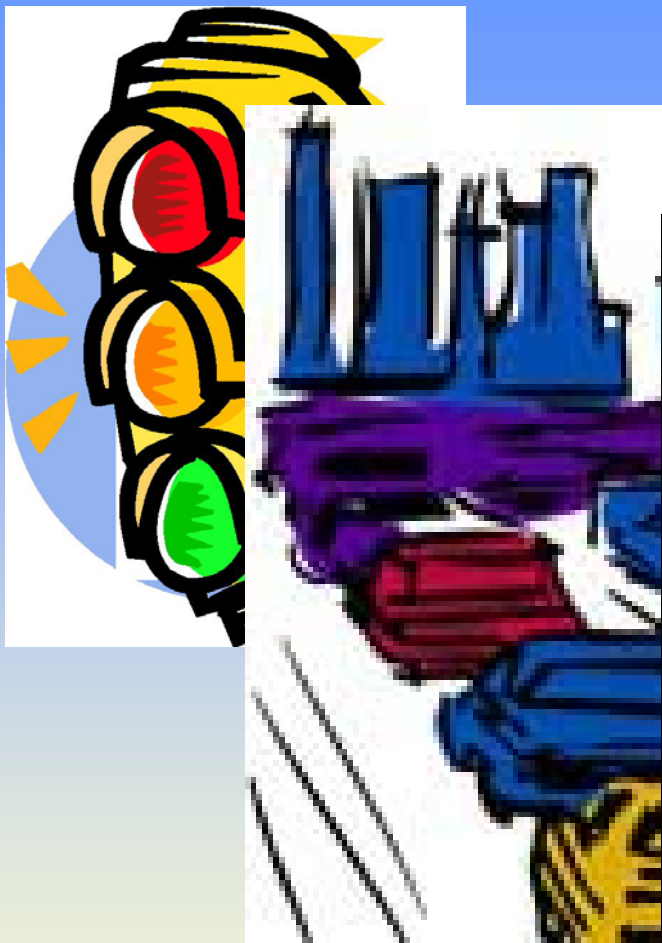
PCB Homologs

Homolog	Abbreviation	Cl Substituents	PCB Congeners
Monochlorobiphenyl	MoCB	1	3
Dichlorobiphenyl	DiCB	2	12
Trichlorobiphenyl	TrCB	3	24
Tetrachlorobiphenyl	TeCB	4	42
Pentachlorobiphenyl	PeCB	5	46
Hexachlorobiphenyl	HxCB	6	42
Heptachlorobiphenyl	HpCB	7	24
Octachlorobiphenyl	OcCB	8	12
Nonachlorobiphenyl	NoCB	9	3
Decachlorobiphenyl	DeCB	10	1

# Presentation

**Greg Cavallo, DRBC**





**Avoid accidents**

**&**

**Protect human health**

# Issues

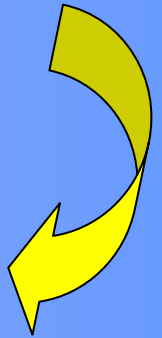
- **TMDL**
  - **Regulatory**
  - **Lacking PCB data**
    - **Ambient water**
    - **Effluent**
  - **Needs**
    - **Monitoring**
      - **Ambient**
      - **Effluent**
        - » **Voluntary**
        - » **Permits**
    - **Options**
      - **EPA Method 1668A**
      - **USGS SPMDs**



# LUNCH



- Monitoring & Analytical Methods  
– Mark Richards
- Permit Guidance – Allan  
Brockenbrough
- Guidance Development





# LUNCH

- break -



# Where – Discharges to ....

All waters



y

0?

# Who -

## PCB impaired waters

- Majors
- CSOs
- Minors
- Industrial stormwater outfalls
- MS4
- Mining outfalls
- Non-contact cooling waters

# **Potential sources**

## **- industrial / commercial -**

<b>SIC Code</b>	<b>Code Name Facility</b>
<b>26</b>	<b>Paper and Allied Products</b>
<b>30</b>	<b>Rubber and Misc. Plastics</b>
<b>33</b>	<b>Primary Metal Industries</b>
<b>34</b>	<b>Fabricated Metal Products</b>
<b>37</b>	<b>Transportation Equipment</b>
<b>49</b>	<b>Electrical, Gas and Sanitary Services</b>
<b>1221 &amp; 1222</b>	<b>Bituminous Coal</b>

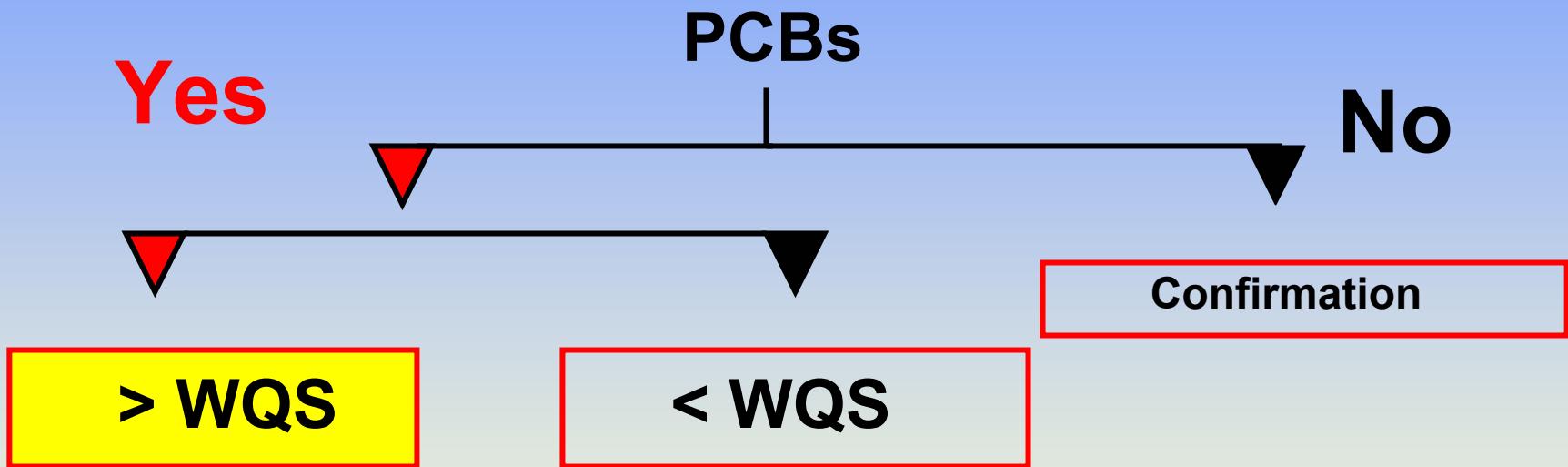
# **When -**

- **Monitoring**
  - **Strategy w/n 2 yrs of TMDL**
  - **VPDES**
- **How**
  - **frequent**
  - **long**

# Frequency -

- **# of samples**
  - wet (high)
  - dry (base)
- **Type & size**
  - Major
  - Minor
  - Industrial stormwater
  - CSO (wet only)

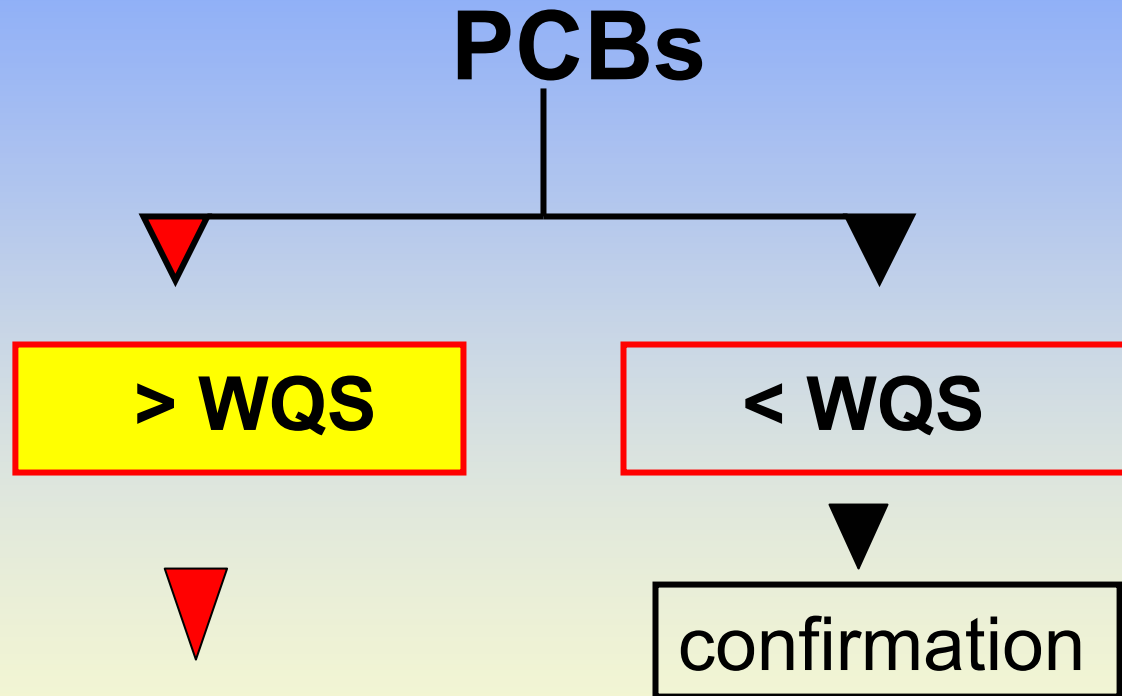
# Duration -



**Water Quality Standard (WQS) = 1.7 ng/l**

**Proposed = 0.64 ng/l or 640 pg/l**

# Duration -



**Confirmation + options =  
pollutant minimization plan (PMP) or  
storm water pollution prevention plan (SWPPP)**



Discussion

# Schedule

- **Summary**
  - **Send to TAC**
  - **Post on web**
- **Meetings**
  - ***Draft by May 1 & schedule 2nd meeting***
  - **Final meeting with guidance document - *July***

# Guidance Document Outline

## *TMDL Monitoring and/or Data Collection and Analysis to Characterize Point Source Loadings of Low Level PCBs*

- ***Background***
- ***Objective***
- ***Procedure***
  - ***Facilities***
  - ***Method***
  - ***Frequency and Duration***
  - ***Analytical Requirements***
- ***Laboratories***

